

Chapter 5. Electronic Commerce Implementation Strategy

The Electronic Commerce Acquisition Team (ECAT) has recommended an acquisition architecture centered around the need to present a “single face to industry.” This “single face” is critical for both the government and industry as well as for opening up competitive opportunities to more firms. To recap, the core elements of the architecture are as follows:

- A single means of supplier registration to do business electronically with the Federal government, including a standardized trading partner agreement embodying the “rules of the road”
- A standard method of implementing the electronic data interchange (EDI) transaction formats (currently the ASC X12) used in the United States
- Capability of agency procurement and financial systems to generate and receive standard EDI ASC X12 transactions (i.e., agencies would modify their existing systems to feed data in “flat file format” to a commercial off-the-shelf software package, called a translator, that generates the ASC X12 transaction)
- A “virtual network” for delivering standardized transactions to facilities where value-added networks (VANs) or other entities can access them as well as for delivering transactions back from those entities
- A standard agreement between the government and the VANs that supports the government and its trading partners
- A standards-based system permitting agency procurement and finance staff to access government data bases supporting their operations
- The use of electronic funds transfers (EFT) as the principal method of payment and the development of a more supportive EFT architecture.

Any architecture or plan is only as good as its execution. The previous four chapters have laid out a vision for how the Federal Government will move to presenting a “single face to industry” as it implements electronic commerce (EC). Achieving this

architecture will require a number of coordinated actions, many of which are still being planned by the agencies. This vision will evolve in response to comments on this report as well as changes in the marketplace but the true test of the architecture will be how it is implemented.

KEY IMPLEMENTATION FACTORS

Effective implementation of the architecture depends on adjusting to several core realities:

- Tight deadlines limit the amount of time available to plan.
- Existing government efforts in electronic commerce need to migrate to a consistent vision of doing business electronically. For example, the Department of Defense (DoD) is pursuing an aggressive strategy of implementing its own move to a “single face” approach.
- Many agencies have not been involved in electronic commerce in the past. They have much to learn as they implement a new way of doing business.
- Agency implementation plans must address the fact that some parts of the acquisition architecture do not exist yet.
- Individual agency actions need to be coordinated to ensure they meet the “single face” imperative.
- Success depends to a large degree on maintaining the government’s credibility with trading partners. This means meeting scheduled targets. Optimistic objectives that are missed can do more damage than less aggressive objectives that are, in fact, met.

THE “PLAN/ACT, PLAN/ACT” MODEL

The traditional approach to fielding new systems is built around a systematic process of determining requirements, choosing decision criteria, evaluating alternatives, selecting a preferred approach, implementing that preferred approach, and evaluating the effectiveness of the new system. This systems development methodology is also keyed to an information architecture for the enterprise. Developing large systems according to this approach has become increasingly difficult as the rate of change in technology has accelerated. For example, if it takes 3 years to develop a system, it may be out of date by the time the system is

operational. Excessive emphasis on the traditional approach, or on planning per se, runs the risk that plans do not get transformed into outcomes.

Some have suggested that the priority should be on implementation with a strong focus on the near term. By concentrating on near-term outcomes, management would have more confidence that investments in information systems are paying off. The danger in concentrating too much on implementation is that the series of short-run investments may, in hindsight, look questionable. For example, fielding systems quickly without planning for standardization can lead to very costly integration problems down the road because the individually justified systems do not work well together.

Today's world is one in which technology is changing rapidly, and today's assumptions about the future may prove to be unwarranted in a very short period of time. This means that good strategies involve continual retesting against the outside world to make sure they are still current. Shorter terms and more deliverables are ways to test the validity of the approach.

Today's world is also one in which commercial products have more and more capability that only recently would have required a substantial amount of custom development. Commercial products costing only a few hundred to a few thousand dollars offer features that were once only the province of elaborate and expensive custom systems. Often they can be incorporated into operations in a fraction of the time required for custom solutions.

Managers, therefore, need to plan for a changing environment, implement systems quickly, adapt regularly to the changes that occur, and rely heavily on commercial products customized to their individual situation. The recommended approaches have all of the above characteristics. The near-term deadlines put an emphasis on action. The need for a "single face" puts an emphasis on interagency planning and coordination, the changes in the marketplace put an emphasis on strategies that can be modified as the external environment changes, and the ready availability of commercial products in this market puts an emphasis on use of off-the-shelf solutions.

Accordingly, we recommend that implementation plans have the following characteristics:

- An architectural vision should guide planning and implementation. The ECAT report presents one for the government as a whole. Individual agencies will need to have their own agency-specific architectures as well.
- The architectural framework should be reevaluated continually against the external environment and modified as appropriate. We are presenting the acquisition architecture for comment out of a recognition that other communities will have useful insights and that the architecture will need to evolve with the rest of the world.
- Key deliverables should always be no more than 12 months off. Although later deliverables should be included, plans will continually be tested against outcomes in the near term. The deadlines in the President's memorandum drive the government toward initial EDI transactions in September 1994 and more robust activities by July 1995.
- Individual projects should be evaluated against the overall architecture on a regular basis. This will come about through the evaluation of deliverables.

We believe this strategy of incremental actions against a strategic vision offers a sound approach to implementing electronic commerce.

IMPLEMENTING THE ARCHITECTURE

Implementing the architecture depends on four activities. First, an Electronic Commerce for Acquisition Program Management Office (ECA-PMO) will be chartered to support oversight of the overall effort. Second, individual agencies will convert their in-house systems to electronic commerce. The administrator of the Office of Federal Procurement Policy has requested implementation plans for the short run by May 1994 and initial long-run plans by July 1994. Third, several infrastructure development efforts will be started. The most significant are implementation of the virtual network, development of a standard trading partner registration system, and development of cross-agency data bases. Fourth, outreach efforts to vendors need to be expanded, particularly those to small businesses.

ESTABLISHMENT OF ELECTRONIC COMMERCE FOR ACQUISITION PROGRAM MANAGEMENT OFFICE

We are proposing the charter of an ECA-PMO to assist agencies and trading partners transitioning to full electronic commerce for acquisition implementation. The office, cochaired by the General Services Administration (GSA) and DoD, staffed from civilian and defense agencies, will represent various functional disciplines. The ECA-PMO will provide

- government-wide support,
- oversight of agency implementation,
- outreach to agencies to develop an initial capability by September 1994,
- formal training seminars for agencies,
- monitoring of lead agencies' projects,
- implementation conventions (ICs) consistent with the standards and schedule,
- representation for the Federal government with various standards bodies, and
- early vendor registration coordination to maintain a "single face to industry."

The ECA-PMO will devote its resources between now and July 1995 to coordinating the efforts of DoD and civilian agencies. This report has charted a course for government-wide implementation of electronic commerce in Federal acquisition. At the same time, the DoD has continued its efforts to implement its EC strategy. These two plans must unite as a single effort. The DoD and government-wide EC infrastructure and processes must fit hand-in-glove to maintain a coordinated, effective "single face to industry."

AGENCY CONVERSION TO ELECTRONIC COMMERCE

Agencies not using EDI today should begin to prepare their internal systems for electronic commerce. Preparation involves measuring the degree of automation and EDI capability in the agency, identifying pilot offices for initial implementation by September 1994, and developing technical support. Initially, the agency should determine its current EC baseline capabilities. The baseline should include an inventory of the skills in the

organization and supporting assets needed for EC processing, as well as their current automation capabilities. To be EDI capable, a system must be able to generate the relevant acquisition documents automatically in a flat file format.

Each agency should select a pilot office (or offices) that will be EDI ready by September 1994. The office selected should have a manageable work load and an able and willing staff. This office can serve as a model for others in the agency and assist in identifying obstacles, best practices, and resource requirements. A limited cost-benefit analysis can be useful.

In determining technical support, an agency needs to access the current communications infrastructure and capability. To integrate EDI into current business practices, it is necessary to establish an EDI gateway, internal and external communications support, and a means of “connecting” with a value-added network (VAN) to route business transactions to trading partners. Many agencies have local and wide area networks that enable intra- and interagency communications. In addition, they have the technical capability of providing local or centralized EDI translation support and/or connectivity to VANs. If this is not the case, EDI can be accomplished by entering into an interagency agreement for EDI gateway and/or telecommunications support. However, a short-run telecommunications strategy must be determined prior to September 1994.

Generally, agency systems and EDI capability can be categorized four ways: no existing automation, outdated procurement application system, good system without EDI, and good procurement system with EDI. The actions that agencies must take to achieve EDI capability vary depending on the status of their current procurement systems. These actions are listed in Table 5-1.

In addition to accessing technical needs, agencies must also begin addressing business requirements and developing a migration plan from a paper to an electronic environment. This includes recruiting EDI-capable trading partners, identifying the VANs to which they subscribe, and determining the order of business documents to convert to EDI. During the implementation period, it will be necessary to deal with non-EDI-capable trading partners and manage both processes.

Table 5-1. Planning Required for Different Levels of Automation

Action Required	No Automation	Outdated System	Good System Without EDI	Good System With EDI
Identify EDI-capable trading partners	X	X	X	
Research commercial off-the-shelf procurement systems	X	long-term		
Research commercial off-the-shelf translators	X	X	X	
Develop flat file from existing system		X	X	
Review link between procurement and finance		X	X	X
Review draft conventions	X	X	X	X
Migrate to standard conventions				X
Ensure ADP staff are trained	X	X	X	X
Ensure buyers are trained	X	X	X	X
Identify pilot/prototype projects	X	X	X	X
Ensure system processes incoming quotes	X	X	X	X
Identify reengineering opportunities	X	X	X	X
Contact ECAT	X	X	X	X
Determine if interagency agreements are needed	X	X	X	X

Figure 5-1 identifies the basic data flow of a government procurement document, focusing on the EC process. This diagram helps identify both internal business and automation requirements.

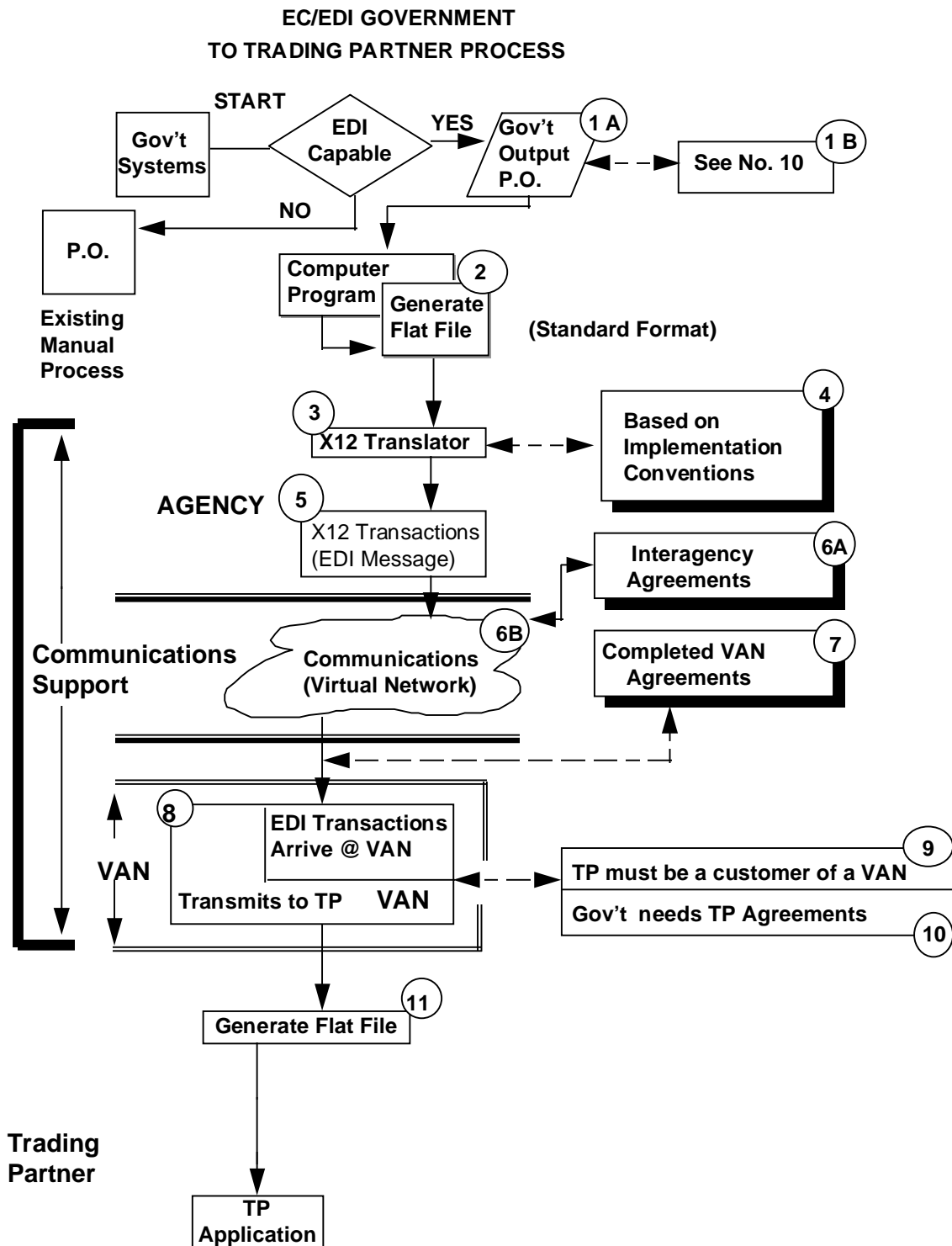


Figure 5-1. Basic Steps in EC Process

DEVELOPMENT OF INFRASTRUCTURE

Throughout the report, we have explored how the Federal acquisition and finance processes can be altered to create a new work environment: a “single face to industry.” Central to creating a “single face” EC system for the Federal government is a single registration process, a virtual network infrastructure accessible by government and industry, and cross-agency data bases that meet the needs of all users. This section summarizes the three infrastructure core activities that lead agencies must consider for implementation.

Vendor Registration

The DoD is the lead agency for developing an EC trading partner registration system. The trading partner registration system is scheduled for completion by February 1995. In the interim, DoD will use the 838 transaction set, Trading Partner Profile, to register new trading partners. Agencies that have the capability to accept an 838 transaction set can establish their own interim procedures in coordination with the ECA-PMO. Agencies that lack the capability to use the 838 transaction set should work with DoD or another 838-capable agency. All agencies should use the government-wide standard 838 transaction set when it becomes available this summer. Close coordination with the other Federal agencies will be important as DoD develops the trading partner registration system. Agencies will need to share trading partner registration information with the DoD central registration site. In performing the system requirements analysis, the DoD will have to communicate with agencies and assess their needs. DoD’s project team will need an agency point of contact on agency trading partner file structures and existing system requirements. Specific file transfer requirements must also be developed for each agency. Each agency must establish a project team for implementation.

GSA will develop government-wide policies for trading partner registration, representations and certifications, and the standard trading partner agreement (TPA). Agencies with their own TPAs will need to assess a phased conversion to the standard TPA.

VANs are key to the “single face to industry” EDI registration and acquisition program. The lead agency maintaining the representations and certifications (master solicitation file) and TPA must develop a working agreement with the VANs for providing these documents to trading partners. Agencies should begin

informing trading partners of the importance of working with a VAN under EDI.

Within the next 12 months, the key activities that GSA must undertake include the following:

- Establish trading partner registration policies and procedures
- Establish project team
- Establish TPA policies and procedures
- Maintain and update TPA
- Work with VANs.

DoD must undertake the following key activities:

- Formulate budget
- Survey agencies' trading partner file structure
- Establish trading partner registration procedures
- Work with VANs
- Develop trading partner registration system.

Virtual Network

The virtual network concept is a technical solution in which there are many architectural alternatives. The virtual network was selected for its economy and flexibility in allowing each agency to establish the protocols and procedures that best meet its needs. Each agency will need to establish a project team to assess its network needs. The assessment must include a survey of existing networks; evaluation of the hardware and software requirements; and determination of system functionality, infrastructure, and security needed for the development of an interim network resolution that will migrate to the agencies' network solution. Procedures will be needed for an interim network and will set the tone for the complete virtual network

Supporting Data Bases

In the preceding chapters, we described the supporting information data bases for full implementation of EC. This is the first combined articulation of the Federal procurement and financial communities automated information needs. Each

supporting information source is essential to creating a comprehensive information web. These information sources are the responsibility of different Federal agencies that we define as the lead agency. Each lead agency has the responsibility for developing and integrating its information data base into a government-wide system. Some information sources are paper-based systems, some are automated. The goal is linking these disparate information sources into an automated information web to support the Federal procurement and financial communities' information needs into the next century. Agencies will need to involve their customers in the design of their data base. The schedule for implementing and integrating these data bases stretches over several years.

The minimum steps that each agency should take to develop this Federal network infrastructure and supporting data bases in the short term include the following:

- Establish a project team and plan
- Work with ECA-PMO and other lead agencies on standardizing communication strategies
- Develop requirements analysis and cost-benefit analysis
- Establish an interagency project team and agreements.

Steps for the long term include the following:

- Budget for full project cost
- Evaluate security requirement
- Implement.

OUTREACH TO VENDORS

Outreach to all trading partners is essential for the success of EC. The long-term overall outreach plan utilizes both the government and vendor community to the fullest extent. A lead Federal agency will oversee the program, define the program mission, and coordinate among other Federal agencies their EC outreach plan. It is expected that the Small Business Administration will provide a strong leadership role to the small business community on outreach. Individual agencies will need to develop an agency-wide outreach plan, assign implementation responsibilities, prepare training materials, and coordinate with the lead agency. Agencies will need to communicate within their

organization the benefits of EDI for the organization and for trading partners. As agencies implement EDI they should conduct transition conferences with their trading partners that include VAN providers. VANs can be an useful source of information and assistance when implementing EDI.

Key outreach implementation tasks include

- developing a government-wide outreach plan,
- assigning implementation responsibilities,
- preparing outreach packages,
- advertising the program, and
- holding conferences.

LONG-TERM IMPLEMENTATION

Much of the above discussion has been concerned with short-term implementation questions. However, an agency's short-term interim implementation strategy (which may consist of short-term actions to meet a short-term deadline) should be part of a long-range EC vision for the agency. The implementation of an initial capability by September 1994 must support the government's long-run objective of moving to a new way of doing business. This is consistent with the "Plan/Act, Plan/Act" model discussed at the beginning of the chapter.

From a strategic standpoint, one should explore the potential of EDI as an enabling technology that supports streamlined business processing and facilitates electronic communications between agencies and the outside world. The process of moving to a long-term strategy for EC implementation should include a more rigorous look at reengineering needs and building a system that takes advantage of the greatest number of improvements. There are many places in this capability analysis where an agency must decide if it wants to invest more in its existing procurement application. If the acquisition and related finance, property and receiving and requisitioning systems are now separate and do not communicate, the amount of time and money to be invested for a test of EDI is a significant issue. An agency may choose incremental, less costly short-term solutions and plan on investing time and money in a long-term reengineered business solution. The ultimate goal is to have a series of related processes that all use either the same system or are integrated so that data are shared

among systems, not paper between people. A key point to remember is that reengineering processes should drive automation efforts, and not the other way around. Technology should not drive solutions.

In analyzing internal processes and systems for a long-term strategy, agencies should consider the government-wide EC infrastructure, data bases, and services supported by this architecture. For instance, the EC system includes a strategy for accessing common data bases that contain necessary vendor information (e.g., address and socioeconomic status), payment instructions, common terms and conditions for solicitations, various wage data, and other information. The process and system design should consider how to interface with these data bases and automatically integrate the information into the procurement process.

The short-term actions that the government has begun will satisfy both the short-term objective of facilitating electronic commerce and the long-run imperative of improving the government's processes to better meet citizen needs. The steps taken as part of this program to improve procurement and financial systems over the longer run will facilitate broader changes in how the government operates.

NEXT STEPS

Completing the agency short- and long-term project plan is just the beginning of an improved working relationship among the various Federal agencies. As we head towards the initial implementation date, there are several important initiatives that must be coordinated and completed. Many of these initiatives are ongoing and will continue throughout the life of the project.

AGENCY IMPLEMENTATION PLANS

Agency implementation plans should be treated as living documents and be reviewed continually. Further, agencies should use this plan as a basis for internal project management plans. Milestones, major tasks and subtasks, with due dates, and assigned resources should be identified. A interdisciplinary team should be assigned the responsibility of overseeing the progress of internal implementation efforts. The ECA-PMO is available to assist in

developing short- and long-term plans and in developing a working project management plan.

UPDATE AND FINALIZE FEDERAL ELECTRONIC COMMERCE REPORT AND ARCHITECTURE DESIGN

Agencies and industry groups will have 30 days to review and comment on this draft report. The ECAT will be in touch with agency representatives to further discuss their comments and to ensure that concerns are addressed. We are committed to working with them in developing a government-wide architecture that supports all agency activities and addresses the objectives in the President's memorandum.

IMPLEMENTATION OF THE GOVERNMENT-WIDE EC SYSTEM

ECA-PMO will work with each agency in identifying EDI and telecommunication requirements. Several agencies have volunteered to develop EDI and telecommunications capabilities that will be available to other government agencies. ECA-PMO will assist in the coordination of this effort to insure a successful virtual network technical solution and a single face to industry.

PREPARATION OF INTERNAL PROCUREMENT AND FINANCIAL SYSTEMS

In addition to reviewing and modifying existing procurement systems to support EDI, agencies must begin preparing payment systems to receive and process electronic invoices. Steps involved include

- mapping the Federal standard invoice transaction set 810 to a record that can be taken into the payment system,
- arranging an interconnection to retrieve translated invoice transactions,
- editing invoice transactions and resolution of edit errors, and
- modifying the payment system (if necessary) to automatically match invoice to purchase order and receiving report.

Agencies should identify vendors with whom they do recurring business, with a special emphasis on high volumes of invoices. They should initiate discussions with these trading partners to register them, to establish electronic invoicing capability, and to emphasize efficiencies that can be realized by both parties.

If reporting from receiving systems is currently paper based, agencies should plan a transition to electronic receiving reporting, integrated with procurement systems, focusing on concentrated points for receiving goods. Long-term plans should aim for total electronic receipt reporting. Agencies should plan for EFT payments to the maximum extent possible.

IMPLEMENTATION CONVENTIONS

By June 1994, the initial set of ICs necessary to conduct small purchases will have been reviewed by interested agencies. Industry and others will complete their review and comment by July 1994. The first version of these ICs will be available by September 1994.

Agencies must ensure the flexibility to incorporate IC revisions to their initial EC strategy and deployment. Regular contact with the EC/EDI Standards Management Committee, through the ECA-PMO, is encouraged to resolve initial implementation problems. This liaison will be especially important as the government's use of EDI and necessary ICs expands beyond small purchases to all procurement and other business needs, such as status inquiries, ship notices, and catalogs. Significantly, development and completion of the initial government-wide ICs will not be a finite project. Rather, ICs will continue to evolve to allow more efficient use of the transaction sets.

OTHER IMPLEMENTATION ACTIONS

This chapter has concentrated on some of the more important implementation steps. Others are included in the detailed discussion in the body of the report. Additional technical details are covered in the appendices.